Trend Study 17-57-00

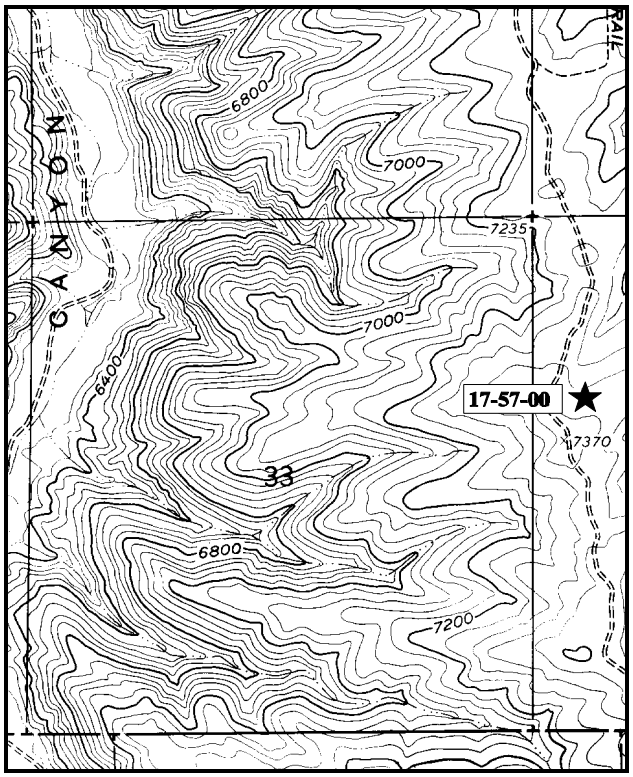
Study site name: Skitzy Canyon . Range type: Chained, Seeded P-J .

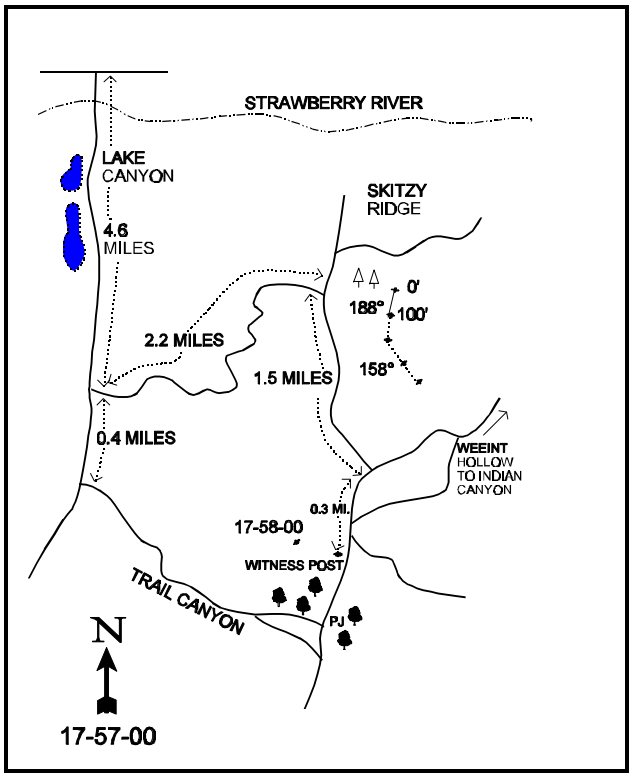
Compass bearing: frequency baseline 188°M .

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Belt 2 rebar @ 5ft.

LOCATION DESCRIPTION

From the Strawberry River, take the Lake Canyon Road (3239 West) south for 4.6 miles to a road which goes up the canyon to the east. Turn left and drive approximately 2.2 miles up to a "T" intersection at the top of the ridge. [Skitzy Ridge can also be reached via Trail Canyon the next (south) side canyon of Lake Canyon, or from Indian Canyon along the Weeint Hollow road]. At the top, look east into the chaining for two large conifers (Douglas firs). The 0-foot baseline stake is located to the east of the two trees. The baseline is marked by green, steel fenceposts approximately 12-18 inches in height.





Map Name: Buck Knoll

Diagrammatic Sketch

Township 4S , Range 6W , Section 34

UTM 4437809.805 N, 537851.536 E

DISCUSSION

Trend Study No. 17-57 (14-4)

This trend study is located on a pinyon-juniper chaining in Skitzy Canyon. The area is considered deer and elk winter range. The site has an elevation of 7,300 feet. Management for this area is with the Utah Division of Wildlife Resources. The study site is located on a ridge top where terrain is essentially level. The land slopes gently to the north-northeast, draining into Skitzy Canyon. Prior to treatment in 1977-78, the site was dominated by Utah Juniper and Colorado pinyon. Currently ('00), surviving and released pinyon and juniper trees have an estimated density of 44 trees/acre. The area is used heavily by elk and to a lesser extent by deer and livestock. Pellet group data from 2000 estimated 90 elk, 7 deer and 9 cow days use/acre (222 edu/ha, 17 ddu/ha and 22 cdu/ha). Deer pellet groups were recent while all cow pats were from the previous year (1999). About half of the elk pellet groups encountered were from spring.

Soils are relatively shallow and rocky, but stabilized as a result of excellent herbaceous vegetative cover. Effective rooting depth is estimated at just over 10 inches with much of the rock encountered in the top 4 inches of the soil profile. Soil texture is a sandy loam with a slightly alkaline soil reaction (pH of 7.8). Percent organic matter is very high at 8.4%. Erosion and soil loss prior to treatment was heavy, which resulted in some areas of pavement and bare ground. Much of this has since filled in with herbaceous vegetation and the rate of erosion being controlled.

Browse is a minor component of this chaining with no shrubs being encountered during the 1982 reading. By 1988, only a few black sagebrush and mountain big sagebrush were sampled. In 1995, the most numerous shrub was black sagebrush with an estimated density of 540 plants/acre. Age class distribution indicated an increasing population. Mountain big sagebrush had an estimated density of only 100 plants/acre. Use of these sagebrush species was mostly light. Density of black sagebrush continues to increase. During the 2000 reading, density was estimated at 820 plants/acre. The number of seedlings and young declined considerably, but the population will most likely slowly increase in the future. Density of mountain big sagebrush has declined slightly since 1995. Use of this more preferred sagebrush was moderate to heavy. Other preferred browse species occur on the site but did not fall within the shrub density strips. These include true mountain mahogany and antelope bitterbrush.

Grasses dominate the site by providing 73% of the total vegetation cover in 1995 and 76% in 2000. The grass composition is very diverse with 14 species encountered in 1995 and 12 species sampled in 2000. Crested wheatgrass is the most numerous species. It provided 65% of the grass cover in 1995 and 64% in 2000. Smooth brome and Russian wildrye are also fairly common. Forbs are also diverse but they are not abundant. The only common forb is looseflower milkvetch which provided 58% of the forb cover in 1995 and 79% in 2000. Seeded alfalfa was sampled in 1995 and 2000, indicating that it has persisted on the treatment.

1982 APPARENT TREND ASSESSMENT

This area was chained in 1977-78. Since the chaining the soil trend definitely appears to be improving. The development of vegetative cover and litter buildup has acted to reduce erosion and soil loss. The site supports a good herbaceous component but the current composition is not the most favorable for deer winter range. In time, shrub density will eventually increase through natural colonization of native species. However, if high value shrubs are desired more quickly, interseeding or transplanting would be required.

1988 TREND ASSESSMENT

Soil trend is considered slightly down due to a decline in basal vegetative cover and litter cover, combined with an increase in percent bare ground (7% to 12%). Erosion is not a problem however due to the gentle terrain and good distribution of vegetation and litter cover. Since the chaining treatment in 1977, there has been surprisingly little change in the browse component on this area. As in the 1982 study, there were only a few individual browse plants encountered. Many young shrubs were observed throughout the area, but were not common enough to be sampled. The general view photographs show a slight increase in the prominence of woody species, but grasses still dominate the site. Trend for browse is considered slightly up but density is still very low. Trend for the herbaceous understory is slightly up. Quadrat frequency of grasses increased while frequency of forbs remained similar to 1982.

TREND ASSESSMENT
soil - slightly down (2)
browse - slightly up but density is limited (4)
herbaceous understory - slightly up (4)

1995 TREND ASSESSMENT

Some ground cover characteristics have improved since 1988. Litter cover declined from 68% to 54%, but percent bare ground also declined from 12% to 7%. Browse is still limited, yet it has continually increased in density. Black sagebrush has increased to 540 plants/acre, 52% of which are young plants. Trend is considered slightly up. Trend for herbaceous understory is stable. Sum nested frequency of grasses and forbs have remained similar to those of 1988.

TREND ASSESSMENT
soil - slightly up (4)
browse - slightly up but density is limited (4)
herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is stable with similar ground cover characteristics compared to 1995. There is no significant erosion occurring due to the excellent herbaceous understory and litter cover. Trend for browse is slightly up and continuing to slowly increase. Density is still poor however. Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses declined slightly but the dominant grass species, crested wheatgrass, smooth brome and Russian wildrye have remained stable. Sum of nested frequency of perennial forbs also declined slightly but forbs currently provide only 11% of the herbaceous cover.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up but density is limited (4)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 17 , Study no: 57

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron cristatum	a159	b259	261	45	64	87	86	11.42	13.32
G	Agropyron intermedium	48	56	61	6	19	25	27	.61	1.12
G	Agropyron trachycaulum	7	16	4	5	3	6	1	.64	.00
G	Bouteloua gracilis	1	-	-	1	1	-	-	-	-
G	Bromus inermis	60	74	72	14	23	28	29	1.89	2.04
G	Carex spp.	b40	ab20	a8	5	16	7	7	.13	.06
G	Dactylis glomerata	-	1	-	5	-	1	-	.00	-
G	Elymus cinereus	4	17	9	3	2	6	3	.62	.74
G	Elymus junceus	23	19	38	7	11	10	16	1.10	1.44
G	Elymus salina	-	-	6	-	-	-	2	-	1.23
G	Festuca ovina	a-	a1	b20	-	-	1	8	.03	.21
G	Oryzopsis hymenoides	-	4	-	4	-	2	-	.18	-
G	Poa fendleriana	-	3	2	-	-	1	2	.03	.03
G	Poa secunda	a-	c32	b4	15	-	14	3	.25	.04
G	Sitanion hystrix	c101	b12	a-	40	43	8	-	.04	-
G	Stipa lettermani	b122	a47	a34	35	56	22	15	.58	.45
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		565	561	519	185	238	218	199	17.56	20.72
Total for Grasses		565	561	519	185	238	218	199	17.56	20.72
F	Androsace septentrionalis (a)	-	b40	a2	-	-	19	1	.12	.00
F	Antenneria rosea	-	-	-	1	-	-	-	-	-
F	Arabis spp.	a3	ab12	b19	-	2	7	9	.03	.04
F	Astragalus convallarius	12	4	-	1	5	2	-	.04	-
F	Astragalus miser	-	15	17	-	-	8	9	.57	.48
F	Astragalus tenellus	b45	a17	a16	17	19	9	9	3.78	2.28
F	Calochortus nuttallii	-	-	-	1	-	-	-	-	-
F	Chaenactis douglasii	-	5	3	5	-	2	1	.01	.00
F	Descurainia pinnata (a)	-	b8	a-	-	-	4	-	.02	-
F	Eriogonum alatum	15	12	3	7	8	8	2	.14	.03
F	Erigeron flagellaris	-	-	-	1	-	-	-	-	-
F	Erigeron eatonii	3	2	-	-	1	1	-	.00	-
F	Eriogonum umbellatum	-	-	4	-	-	-	1	-	.00
F	Gayophytum ramosissimum (a)	-	3	-	-	-	2	-	.01	-
F	Grindelia squarrosa	-	3	-	1	-	1	-	.00	-
F	Hedysarum boreale	-	1	-	-	-	1	-	.15	-
F	Ipomopsis aggregata	1	6	-	1	1	2	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Linum lewisii	-	3	-	1	-	1	-	.00	-
F	Medicago sativa	-	7	3	1	-	2	2	.56	.21
F	Penstemon caespitosus	1	-	-	-	1	-	-	-	-
F	Penstemon pachyphyllus	-	5	-	-	-	2	-	.01	-
F	Sisymbrium altissimum (a)	-	3	-	-	-	1	-	.00	-
F	Trifolium spp.	-	-	-	2	-	-	-	-	
Total for Annual Forbs		0	54	2	0	0	26	1	0.15	0.00
Total for Perennial Forbs		80	92	65	39	37	46	33	5.34	3.07
Total for Forbs		80	146	67	39	37	72	34	5.50	3.07

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 17 , Study no: 57

Type	Species	Strip Frequency		Average Cover %	
		'95	'00	'95	'00
B	Artemisia nova	12	15	.64	1.18
B	Artemisia tridentata vaseyana	5	4	.21	.84
B	Chrysothamnus nauseosus	1	0	-	-
B	Chrysothamnus viscidiflorus lanceolatus	0	1	-	-
B	Juniperus osteosperma	0	2	.03	.78
B	Pinus edulis	0	3	.03	.81
Total for Browse		18	25	0.91	3.61

CANOPY COVER --
Herd unit 17 , Study no: 57

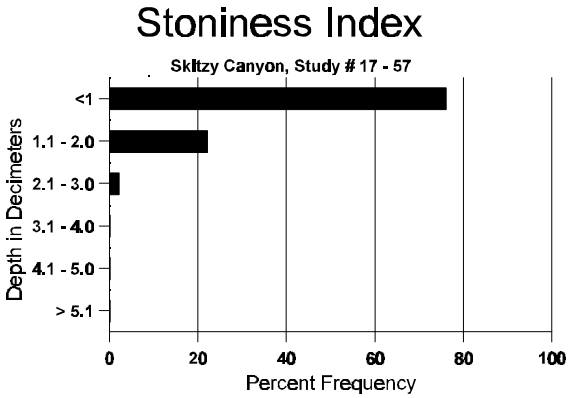
Species	Percent Cover '00
Pinus edulis	.60

BASIC COVER --
Herd unit 17 , Study no: 57

Cover Type	Nested Frequency		Average Cover %			
	'95	'00	'82	'88	'95	'00
Vegetation	325	327	7.50	4.75	26.94	29.00
Rock	237	130	3.25	4.50	12.60	5.57
Pavement	208	214	18.25	10.50	6.38	13.64
Litter	390	386	63.50	68.00	54.15	54.83
Cryptogams	13	66	.75	0	.05	.78
Bare Ground	154	164	6.75	12.25	6.84	7.07

SOIL ANALYSIS DATA --
Herd Unit 17, Study # 57, Study Name: Skitzy Canyon

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
10.49	59.4 (14.25)	7.8	61.3	20.2	18.6	8.4	62.0	252.8	1.6



PELLET GROUP FREQUENCY --
Herd unit 17 , Study no: 57

Type	Quadrat Frequency	
	'95	'00
Rabbit	7	6
Horse	3	1
Elk	42	57
Deer	6	5
Cattle	1	2

Pellet Transect	
Pellet Groups per Acre ⁄00	Days Use per Acre (ha) ⁄00
9	N/A
-	-
1175	90 (223)
87	7 (17)
113	9 (23)

BROWSE CHARACTERISTICS --
Herd unit 17 , Study no: 57

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	15	-	-	-	-	-	-	-	-	15	-	-	-	300			15
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	9	5	-	-	-	-	-	-	-	14	-	-	-	280			14
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133	8	11	2
	95	5	8	-	-	-	-	-	-	-	13	-	-	-	260	17	32	13
	00	20	4	-	-	-	-	-	-	-	24	-	-	-	480	14	27	24
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	9	1	-	2	-	-	-	-	-	9	3	-	-	240			12
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	+75%
'95	48%	00%	00%	+34%
'00	12%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	0	Dec:		0%
'88	133			0%
'95	540			0%
'00	820			29%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66	15	10	1
	95	2	1	-	-	-	-	-	-	-	3	-	-	-	60	27	42	3
	00	-	1	1	-	-	-	-	-	-	2	-	-	-	40	23	38	2
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	+34%
'95	20%	00%	00%	-20%
'00	25%	25%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	0	Dec:		0%
'88	66			0%
'95	100			0%
'00	80			25%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	22	39	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'88	0		-
'95	0		-
'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20	31	33	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	34	45	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	20		-
	'00	0		-

Chrysothamnus viscidiflorus lanceolatus																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	36	58	0
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	0%
	'88	0		0%
	'95	0		0%
	'00	20		100%

Chrysothamnus viscidiflorus viscidiflorus																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	28	41	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	40		-

Pinus edulis																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66	41	24	1
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+ 0%
'88	00%	00%	00%	
'95	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	66	Dec:	-
	'88	66		-
	'95	0		-
	'00	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	17	30	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	39	36	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	0		-